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PENETRATION RATE METHODLOGIES[1]

I. SUMMARY OF ENERGY UTILITIES' METHODOLOGY FOR CALCULATING PENETRATION RATES

A. *Joint Energy Utilities* (PG&E, SCE, SDG&E and SoCal)

The Commission adopted the interim methodology used by the joint energy utilities in D.01-03-028. The joint utilities indicated that their penetration rate is calculated by using the following equation:

$$\frac{\text{CARE participating households}}{\text{Total number of program eligible households}}$$

In this equation, the numerator, CARE participating households, is taken from utility records. The denominator, the total number of program eligible households, has to be estimated. To be eligible for the CARE program a household must be technically eligible, meaning the household has a residential meter or a qualified sub-meter, and meet CARE eligibility guidelines.

Since 2000 Census data will not be available until 2003, the energy utilities use a 5% sample of the 1990 Census, referred to as Public Use Microdata Sample (PUMS) data, as the primary source of information to reach a joint relationship between household size and income. PUMS data are at the geographical Public Use Microdata Area (PUMA) level, which is equivalent to a population of 100,000. This first step of data preparation requires looking at a table for one geographical area in the Census for one

[1] Excerpted from the Energy Division Report, dated April 2, 2002.

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specific block group. Taking into account all the different counties results in over 200 different tables.

The next step is to disaggregate the PUMS data and tailor the data to represent utility estimates. They use Master Area Block Level Equivalency (MABLE) tables, which are correspondence Census tables developed by the Missouri Census Data Center, to break up the data to the block group level. Since the PUMS data are household level data, the broken up data can be re-aggregated to represent the areas served by the utilities, by fuel type, and by county. The result is a 1990 PUMS updated table showing the joint distribution of household size and income. In order to look at this joint distribution in terms of current year, the 1990 PUMS needs to be updated with current year Census data. Fortunately, there are vendors, like Applied Geographic Solutions (AGS), that specialize in updating Census data. For example, the 2000 Census is not 100% complete, but periodically, the Census Bureau will release parts of the 2000 Census as they become available. Since AGS is in the business of updating Census data, it will have access to these updates as they become available.

By using current year vendor data, which are not joint distributions but separate distributions of household size and income, they can develop a current year estimated joint distribution. This is accomplished by using a widely accepted statistical method called iterative proportional fitting (IPF), which takes the current year distribution of household size and the current year distribution of household income and matches them to the

1990 PUMS data. The result is an estimated current year joint distribution, which becomes the basis for CARE penetration.

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Finally, this estimated current year joint distribution is multiplied by the proportion of eligible households for each combination of household income and size and summed together. This yields the number of eligible households per million, which can then be converted to a demographic eligibility rate for a particular county, utility, and fuel type. When applied to quarterly counts of technical eligibility, the result is an estimate of the number of households that are program eligible. The last step is to take the total number of CARE participants from utility records and divide by this estimate.

B. Avista Utilities

Avista Utilities (Avista) provides gas service in the Tahoe area. Avista indicated there are many resort communities and second homes in their territory. Avista estimates one-third of the 18,000 residences they provide service to are secondary or vacation homes. Avista assumes these customers are not eligible for CARE because low-income customers are not likely to have vacation or second homes. Avista is not aware if any of their customers, who are not eligible for CARE, apply for the program because the Department of Community Service and Development (DCSD) performs the CARE certification.

To determine its penetration rates, Avista first takes the net percentage of households not eligible, due to being seasonal / secondary homes, from the total residential population. From there, Avista uses data

from the Census website to compare counties in their territory to California. For example, Avista claims that comparing El Dorado County to California in terms of household income and poverty reveals a

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relationship that implies El Dorado is about 55% of that occurring throughout California. Avista infers that whatever the eligible population is on a statewide level, El Dorado's eligibility would be 55% of statewide eligibility. So, if the large utilities have 20% of their households eligible for the CARE program, then Avista would have about 10% eligible, assuming the relationship between California and El Dorado County holds true.

Avista indicated that subtracting the seasonal residential customers from Avista's 18,000 total customers yields 13,000 households. Avista then applies the percentage from the Census web site to the 13,000 households which results in the number Avista estimates is eligible for the CARE rate, which is the denominator of their CARE penetration rate. The numerator is simply the number of participants.

C. Southwest Gas

Southwest Gas (SWG) serves both ends of the spectrum in terms of the general type of community. Placer County has a high per capita income and San Bernardino County has a low per capita income; likewise, SWG estimates about 3.3% in Placer County are eligible for CARE compared to about 29.3% in San Bernardino County. SWG claims that there are some communities that are 60% vacation homes and therefore excluded from CARE participation. In total, they have about 119,000 CARE subscribers. Still, SWG reports their overall penetration numbers

are similar to the large utilities. SWG indicates that some of its service districts have a very high penetration rate of 70%.

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SWG uses an outside company to survey their universe of customers for economic and demographic data. Since SWG is a single-fuel utility, they incorporate only those housing units that have natural gas service. Their estimates are based on cross-tabulations of income and household size and are checked against current Census data for reasonableness. This provides a higher level of accuracy than estimates based solely on Census data.

II. DESCRIPTION OF CENSUS DATA USED BY ENERGY UTILITIES

The energy utilities indicate 2000 Census PUMS data will not be available until 2003. They believe the PUMS data are needed to provide the most accurate estimate for the least cost. In addition to the PUMS data, summary files (SF followed by the version number, i.e., SF2, SF3, SF4) of population and housing specifications from the 2000 Census will be released. According to the U.S. Census Bureau website,[2] SF1 and SF2 provide information from questions asked of everyone, i.e., age and race. SF3 and SF4 will provide estimates from the sample questions, i.e., income. In other words, SF3 will take 2000 Census results and show, for example, how many households are in the $0 - $5000 income range, but SF3 will not provide the number of people living in each household. Through their

vendors, the energy utilities update 1990 PUMS data with these summary files.

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Another option is for the energy utilities to order special tabulations of demographic and income data in California before they become available in the 2000 PUMS. According to the Census Bureau, special requests for a cross-tabulation of household size and income will not be available until SF3 is released, since that is when income data will be available. These tabulations will provide the requisite joint distribution the energy utilities need to estimate CARE eligibility. A Census Bureau representative estimates the tabulations at the block group level will cost $800 to $1000 and may take up to two weeks to process.

The energy utilities believe it may not be worthwhile to order the special tabulations of joint household size and income distribution because they are currently using a vendor, (Applied Geographic Solutions or AGS), that has access to the summary file updates. AGS is in the business of capturing demographic data, and they use the most recent data available, i.e., SF3. The energy utilities assert that their current methodology already incorporates the most recent data available. Therefore, the energy utilities recommend waiting for the release of 2000 PUMS data in 2003. They argue that the expected benefits from ordering special tabulations are negligible, as the tabulations are available only six to nine months before PUMS data

[2] www.census.gov

are available. The utilities propose waiting for the updated PUMS data will be the most cost efficient approach.

III. SUMMARY OF TELECOMMUNICATIONS UTILITIES' METHOD FOR CALCULATING PENETRATION RATES

In D.91-07-056, the California Public Utilities Commission mandated the telecommunications utilities (Verizon, formerly GTE, and

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SBC Pacific Bell) to perform a comprehensive assessment of the affordability of telephone service in California. Field Research Corporation (Field Research) conducted the study, referred to as the Affordability Study, which included a non-customer survey and a customer survey. The goal of the study was to determine reasons for not having phone service and to explore the affordability of telephone service; it was not designed to measure ULTS penetration levels.

However, Field Research applied survey results from the Affordability Study3 to estimate households eligible for ULTS, which was used to develop a penetration rate. Starting with total California households, Field Research used the FCC (Federal Communications Commission) telephone penetration rate of 96.1% to determine the total number of customers in California that have telephone service. That would mean 3.9% of Californians are non-customers because they do not have telephone service.

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[3] The Affordability Study consists of a Customer Survey Volume (312 pages) and a Non-Customer Survey Volume (317 pages). Field Research used portions of the Affordability Study for their presentation.

Field Research applied the survey results to these figures to determine the number of customer and non-customer households that qualify for ULTS. Field Research based eligibility for ULTS on household income and family size information gathered from the customer and non-customer surveys. Based on customer survey results from 1993 to 2000, about 20% of total customers qualify for ULTS. Therefore, Field Research

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determined that 19.2% (20% of 96.1%) of total California households with telephones qualify for ULTS.

Of the people that have phones and are eligible, Field Research found that 70% participate in ULTS. The 70% penetration rate does not include low-income customers who may qualify for ULTS but do not have phones. Field Research also quantified the number of customers without phones that were eligible for the ULTS program. They calculate that 82% (or 3.2% of total California households) of these non-customers are qualified to participate in the ULTS program. Adding this number to the 19.2% previously calculated results in 22.4% of total California households eligible for ULTS.

IV. SUMMARY OF SIMILARTIES AND DIFFERENCES BETWEEN CARE PENETRATION RATE METHODOLOGY AND ULTS PENETRATION RATE METHODOLOGY

Both energy utilities and the telecommunications utilities express concern about the fundamental differences that exist between the ULTS and CARE programs. Some of these differences include definition of household, the fact that telephone households are more dynamic and

energy households are relatively static, and the fact that there are municipal utilities providing electricity and / or gas service but few, if any, providing telephone service.

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The following table shows some of the similarities and differences between the CARE penetration rate methodology and the ULTS penetration rate methodology.

	CARE	ULTS
Numerator (Source of data)	The number of CARE participating households (Utility records)	The estimated number of households that are eligible for and enrolled in ULTS. (Utility records on survey sample)
Denominator (Source of data)	The Number of Program Eligible Households per Utility (Census data adjusted to reflect current year)	The number of households that are eligible for ULTS. (Survey results applied to Census data.)
Household size and income	An eligible household has to be technically eligible (residential meter or qualified sub-meter) and demographically eligible (meet the CARE guidelines for household size and income).	According to Field Research, the surveys asked for information on household size and income.
Statistical Methods	Iterative Proportional Fitting	Extrapolating sample population to reflect entire population

Starting with the numerator, the CARE methodology uses actual enrollee numbers as reported by the utilities. While the numerator in the ULTS methodology also reflects the number of enrollees in the program, this number is projected to the population based on survey results.

The denominators, however, do not reflect the same population. The denominator for the CARE methodology includes program eligible households; in other words, households must meet size and income requirements and be technically eligible by having a residential meter or qualified sub-meter. Essentially, this means there is some segment of the

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low-income population that is not included in the denominator because of the technical eligibility requirement. When Field Research estimated a 70% penetration rate, that rate did not include non-customers, so that rate is comparable to the CARE rate.

When considering the denominators, both the CARE and ULTS programs have income and size requirements, and both methodologies reflect these requirements. Differences exist, however, with the way the methodologies determine if households meet these requirements. As described in section two of this report, the energy utilities break up Census data and statistically adjust it to reflect the total households that meet household size and income requirements. The Field Research methodology, assuming it is used to only reflect eligible customers, uses survey questions to determine if households meet size and income requirements.

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